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ABSTRACT

A goal of the St. Paul (Minnesota) Head Start/Public School Early Childhood Transition Demonstration Project is to promote the implementation of developmentally appropriate practices (DAP) in kindergarten through third-grade classrooms through teacher training and the provision of related materials. This project is 1 of 31 sites participating in a federally funded demonstration. The degree of DAP implementation and teachers' efforts to foster parent participation were studied. In addition, the relationship of DAP to student achievement in reading and mathematics, and to classroom behavior (social skills, problem behaviors) was studied, and possible differences in relationships by students' ethnic backgrounds were explored. Two cohorts of children, 248 who entered kindergarten in 1992-93 and 280 who entered in 1993-94, and their families were studied. DAP-related training and classroom materials provided to teachers appeared to have had some impact on project classrooms, although the level of DAP implementation appeared to be quite modest and teachers in the comparison (not DAP) classrooms actually appeared to do more to foster parent participation. There was little evidence of a positive link between DAP and student achievement, but a strong test of this potential relationship was not possible. There was some evidence, although not strong and consistent, for a positive association between DAP and student classroom behavior. (Contains 4 tables, 3 figures, and 14 references.) (SLD)

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ED 410 324

THE IMPLEMENTATION OF DEVELOPMENTALLY APPROPRIATE PRACTICE IN INNER CITY PRIMARY-GRADE CLASSROOMS AND ITS EFFECTS

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ABSTRACT

A goal of the St. Paul Head Start/Public School Early Childhood Transition Demonstration Project is to promote the implementation of developmentally appropriate practices in kindergarten through third grade classrooms through teacher training and the provision of related materials. The degree of implementation of developmentally appropriate practices is examined as well as teachers' efforts to foster parent involvement. The relationship of developmentally appropriate practices to student achievement in reading and mathematics, and to classroom behavior (social skills, problem behaviors), is investigated. Possible differences in relationships by students' cultural/ethnic backgrounds are explored. The limitations and possible implications of the findings are discussed.

INTRODUCTION

There is considerable evidence at the preschool level for the effectiveness of classroom environments and teacher-child interaction that promote child-directed exploration of age-appropriate materials (Piaget, 1962; Consortium on Longitudinal Studies, 1983; Pellegrini, 1983; Elkind, 1986; Kagan, 1989; Morrow and Rand, 1991). While the incorporation of such developmentally appropriate practices (DAP) in early elementary classrooms is increasing nationally, there has been relatively little research to date documenting the effects of DAP implementation on student performance in the primary grades (Gutirrex and Slvain, 1992).

This paper assesses the level of DAP implementation in kindergarten to third grade classrooms in inner-city schools participating in the St. Paul Head Start/Public School Early Childhood Transition Project, one of 31 sites participating in a federally-funded demonstration. The potential relationship of DAP to student achievement and classroom behavior is examined, as well any differential relationships by students' cultural/ethnic background. Other possible effects of the Transition project on teacher behavior (i.e., parent involvement activities) are explored.

BACKGROUND ON THE TRANSITION PROJECT

The purpose of the project is to improve the transition into public school and increase the likelihood of early school success of children from low-income families, particularly of children who have attended Head Start. The project seeks to achieve this purpose by providing "Head Start-like" services to children in grades kindergarten through third grade (a grade is added each operational year of the project). There are four key service components being implemented by the project: family support services, parent/family involvement, health and nutrition, and developmentally appropriate practices. The St. Paul project has implemented the family services component through a professionally staffed resource team and a paraprofessional staff of home-school liaisons who work with families to identify family strengths and address family needs (i.e., basic material, educational, employment, health and social service needs) through the provision of information, assistance or referrals. Parent/family involvement is implemented through a variety of activities for parents and families that the project sponsors or cosponsors (e.g., the Family Workshop, after-school program, family literacy activities, parent discussion groups, field trips, Project Governing Council). These activities are supported by home visits to families, and the provision of transportation, meals and child care. The health and nutrition component is being implemented through the project wellness coordinator and the home-school liaisons working with families to improve their health care, support preschool screening and immunization efforts, and collaborate with community health care providers.

The DAP component is being implemented by providing DAP training and staff development opportunities as well as classroom materials to teachers participating in the project (i.e., teaching at Demonstration schools). The Transition Project has typically sponsored a week-long training in the spring or summer, followed by several workshops during the school year. In the summer of 1995, the week-long training covered several DAP-related topics (cognitively guided instruction in mathematics, cultural diversity, language acquisition) and authentic assessment using the Work Sampling System (Meisels, Jablon, Marsden, et al., 1994). In previous years, training has been conducted by High Scope trainers and covered both theoretical and practical aspects of DAP.

STUDY DESIGN

For purposes of research design, there are two clusters of three elementary schools (a total of six schools) in the study. These two clusters were developed so that they would be similar in total student enrollment and demographic characteristics (e.g., students' family income level, ethnicity). The selection of one cluster as Demonstration (where the Transition Project would be implemented) and the other as Comparison was done by random assignment. In general, the number of students per classroom was similar in the Demonstration and Comparison schools.

Sample

Two cohorts of children and their families are studied longitudinally beginning in kindergarten, in all six schools as part of the National Transition Study. Cohort I children entered kindergarten in the 1992-93 school year (248 children), and Cohort II students entered kindergarten in the 1993-94 school year (280 children). Each cohort is composed of all entering kindergarten students who attended Head Start, as well as an equal-sized sample of children who did not attend Head Start. This non-Head Start group was drawn from the same classrooms as the Head Start children, and stratified random sampling was used to ensure similarity of gender, income and ethnic background (Hmong, other) to the Head Start sample. In St. Paul, a growing number of children and families participating in Head Start programs are recent Southeast Asian immigrants (i.e., Hmong) from Laos. Therefore, nearly half of the study sample is Hmong (46%).

Data included in this report are through the 1995-96 school year. By the end of that school year, most Cohort I children had finished third grade and most Cohort II children had finished second grade. Because of mobility, many students are no longer attending schools in their treatment condition (i.e., Demonstration or Comparison). During the 1995-96 school year, 48 percent of Demonstration group children attended Demonstration schools. Transition services were only delivered to those attending Demonstration schools.

Measurement

Below instruments are described for measuring the level of DAP implementation in the classroom, student achievement in reading and mathematics, and classroom behavior (social skills, problem behaviors).

DAP Implementation

- Assessment Profile of Early Childhood Programs - Research Version (Abbott-Shim and Sibley, 1992). This classroom observation instrument, used by all sites in the national study each year, seeks to measure the presence of those aspects of the learning environment, scheduling, curriculum, interaction and individualization that characterize DAP according to NAEYC guidelines (Braedekamp, 1987). The instrument involves rating a series of yes-no items. Scale scores are calculated (mean of 50, standard deviation of 10) for each of five scales.[1] Higher scores indicate more developmentally appropriate practices. A number of adaptations were made to the original instrument by the authors to better reflect first through third grade classroom practices. For data analysis purposes, study children were assigned Assessment Profile scores based on the classrooms they attended. Data are only available on children who continued to attend classrooms in study schools.

- ADAPT ("A Developmentally Appropriate Practice Template," Gottlieb, 1995). This observation-based instrument was developed by an evaluator at one of the Transition Project sites in an effort to capture the continuum of DAP implementation present in study classrooms in a holistic manner. Ratings are made on a series of items in three broad areas (curriculum and instruction, interaction, and classroom management), plus a summary or global rating, using a five-point scale ranging from no evidence to strong evidence of DAP implementation. Data are available on ADAPT for the 1995-96 school year for second and third grade classrooms.

- Classroom Activity Scale (French and Blazina, 1994). This is a self-administered instrument for teachers developed by evaluators at one of the Transition Project sites, and was adapted for use at the St. Paul site. The instrument focuses on teacher practices related to DAP and parental involvement. Data were gathered on this instrument from second and third grade teachers during 1995-96.

Academic Achievement

- Woodcock-Johnson Psycho-Educational Battery-Revised (1989/90), tests in Broad Reading (Letter-Word Identification, Passage Comprehension) and Broad Mathematics (Calculation, Applied Problems) were administered one-on-one to study children each spring, as well as the fall of kindergarten (baseline). Test scores are available through the spring of 1996. The Woodcock-Johnson tests are used as part of the national study.

Classroom Behavior

- Social Skills Questionnaire, which is part of the Social Skills Rating System, SSRS (Gresham and Elliott, 1990). This is a 30-item questionnaire that teachers rate each spring, kindergarten through third grade. A total standard score is calculated along with scores for three subscales: Cooperation, Assertion and Self Control. The total standard score is not age or grade adjusted, but calculated in the same way for children in grades kindergarten through sixth. Data are available on this instrument through the spring of 1996.

- Problem Behaviors Questionnaire, also a part of SSRS. This is an 18-item instrument that teachers rate in the spring of second and third grade. Hence, ratings are available for the spring of 1995 and 1996 for Cohort I, and for the spring of 1996 for Cohort II. A total standard score is calculated along with scores for three subscales: Externalizing Problems, Internalizing Problems and Hyperactivity. As with Social Skills, the Problem Behaviors standard score is not age or grade adjusted, but applies to all children from kindergarten through sixth grade.

FINDINGS

Implementation of DAP

Assessment Profile

Each study child was assigned the Assessment Profile scale scores that were given to the classroom s/he attended in a given year. Hence, each child had a set of such scores for each year s/he was in the project through the 1995-96 school year. For Cohort I, this was four years (kindergarten to third grade), and for Cohort II, this was three years. An average score across these years was calculated on each scale for each child. These average scores could only be calculated for children who remained in study schools during the course of the study.

Table 1 presents the means of these scores for the Demonstration and Comparison groups in each cohort. Results indicate that the means tended to be higher for Demonstration children than Comparison children, although the differences were generally quite small. Hence, based on the Assessment Profile, Demonstration children attended classrooms that were slightly more developmentally appropriate than Comparison children.

The level of DAP implementation in Demonstration classrooms, although higher than in Comparison classrooms, on the average, was quite modest. All of the means in the Demonstration group (Cohort I and II) were below the scale mean of 50, and two were more than one standard deviation below the mean.

ADAPT

ADAPT results for the 1995-96 school year (second and third grade) also suggest a relatively low level of DAP implementation in Demonstration classrooms overall. ADAPT uses the following scale which refers to evidence of DAP implementation: 1=no evidence, 2=minimal evidence, 3=emerging evidence, 4= supportive evidence, and 5=strong evidence. In 1995-96, the average classroom summary scores for Demonstration and Comparison second grade classrooms were 1.6 and 1.5, respectively. For third grade Demonstration and Comparison classrooms, the average scores were 1.8 and 1.3, respectively. "No evidence" refers to a traditional classroom where most activities are teacher directed and managed, whole group instruction dominates, and content areas tend to be separated, with considerable reliance on commercial materials and uniform child products. "Minimal evidence" suggests that richer materials are available and the physical space of the classroom is adapted to support DAP. Thus, results indicated that Demonstration second and third grade classrooms looked somewhat more developmentally appropriate than Comparison classrooms, but there may have been little difference in classroom management and instructional approaches. ADAPT data are not available for the earlier grades.

Classroom Activity Scale

Classroom Activity Scale results for 1995-96 were available for 12 Demonstration and 10 Comparison group second grade teachers, and 20 third grade teachers divided evenly between the two groups.

The first part of the questionnaire asked teachers how their day was structured with regard to classroom activities. Most teachers reported that the majority of the day was spent doing teacher-directed learning activities, although third-grade Demonstration teachers reported spending less of their time in these activities and more of their time in child-initiated learning activities than third-grade Comparison teachers. Similarly, Demonstration teachers (both second and third grade) reported spending less time in large-group instruction and more time in small group instruction than their Comparison counterparts.

Teachers were also asked a series of questions about their activities related to parent or family involvement. Figure 1 shows the percentages of Demonstration and Comparison teachers who said they had done each activity. The pattern of differences between the two groups

suggests that Comparison teachers were doing more to foster parental involvement than Demonstration teachers. However, it should be noted that Demonstration teachers participated more often in Transition Project-sponsored family activities, which were generally not available to families at Comparison schools.

DAP and Academic Achievement

The relationship of DAP to student achievement was examined using regression analysis. Spring of 1996 Woodcock-Johnson Broad Reading and Broad Mathematics test scores were regressed on their respective baseline scores (fall of kindergarten) and Assessment Profile scale scores. Baseline Woodcock-Johnson scores were entered in step one of this analysis and Assessment Profile scores were entered in step two to test whether Assessment Profile scores (i.e., DAP implementation) contributed to achievement test score gains. These analyses were carried out in both cohorts. Average Assessment Profile scale scores were assigned to students according to the method described above.

Results of the regression analyses are reported in Table 2. Assessment Profile scores did not contribute significantly to achievement tests gains in reading and mathematics in Cohort I. In Cohort II, the Scheduling scale was negatively related to reading and mathematics achievement while the Interacting scale was positively related to reading achievement. Hence, there was no consistent relationship of Assessment Profile scores to achievement gains across cohorts or across reading and mathematics. There is little evidence to suggest a positive link between DAP and student achievement based on these measures. More generally, further analyses revealed no strong or consistent evidence for a Transition program effect on achievement in reading and mathematics.

Separate regression analyses were conducted among Hmong and non-Hmong children. Results were similar to those just reported for the whole sample, with no clear and consistent linkage between Assessment Profile scores and student achievement in either group.

Classroom Behavior

The correlation of Social Skills total standard scores and Problem Behaviors total standard scores with Assessment Profile scores was examined in both cohorts. No strong or consistent relationship was found. However, in 1995-96, ADAPT classroom summary scores were linked

with teachers' ratings of children's social skills and problem behaviors. That is, teachers whose classrooms showed more evidence of DAP implementation on ADAPT tended to give their students higher ratings in social skills and lower ratings in problem behaviors (see Table 3). Second and third grade classrooms (i.e., Cohort I and II) are combined in the analysis presented in the table. Caution should be exercised in interpreting these results because of the small number of cases in the third ADAPT category ("Supportive or Strong Evidence").

There was a tendency for teachers in Demonstration schools to rate their students' social skills higher than teachers in Comparison schools. Figures 2 and 3 show the mean ratings of teachers in these two groups for each year of the study, in Cohort I and II, respectively. While the pattern is not entirely consistent, there appears to be some tendency for higher social skills scores to be given to Demonstration than Comparison students. Similarly, teacher ratings of problem behaviors in the spring of 1996 suggest that Demonstration students may manifest fewer of these than Comparison children, at least in Cohort II (see Table 4).

These findings raise the question of whether the somewhat greater implementation of DAP in the Demonstration group might account for these differences in student behavior ratings between the two groups. Further analysis suggests that differences in DAP implementation do not account for the whole difference. For example, in classrooms rated as having "minimal evidence" of DAP implementation on the ADAPT classroom summary scale, the average Social Skills total standard scores of Demonstration and Comparison students were 111 and 104, respectively ($p<.05$). Similarly, the average Problem Behaviors total standard scores in these same classrooms for Demonstration and Comparison students were 93 and 99, respectively ($p<.05$).

DISCUSSION

DAP Implementation as Part of the Transition Project

The DAP-related training and classroom materials provided to teachers by the Transition Project each year appear to have had some impact on classrooms participating in the project (i.e., Demonstration classrooms). There is evidence, based on classroom observation instruments, for somewhat greater DAP implementation in Demonstration than Comparison classrooms. However, the level of DAP implementation tended to be quite modest in the classrooms of both groups. Demonstration classrooms tended to look somewhat more developmentally appropriate than Comparison classrooms – i.e., greater use of learning centers and a richer array of educational materials for children to access. Demonstration teachers were more likely to provide "choice time" or child-initiated learning activities – i.e., opportunities for the child to select materials and work at his/her own pace during class time. Demonstration classrooms were also more likely to have a posted schedule to which children could refer.

Comparison teachers appeared to be doing more to foster parent involvement at school than Demonstration teachers, based on the teachers own reports. The Transition Project has sponsored and staffed many parent and family activities at Demonstration schools each year. It may be that Transition teachers felt less need to work with parents and families because of the efforts of the Transition Project staff. The apparent lesser involvement of Demonstration teachers with parents may be an unintended consequence of the project.

DAP and Student Achievement

There was little evidence found for a positive link between DAP and student achievement. However, a strong test of this potential relationship was not possible due to some important limitations. First, the range in the level of implementation of DAP in the classrooms studied was not wide. Most classrooms had quite low levels of implementation – i.e., they were either at the beginning stages of implementation or there was little evidence of implementation. Only a few classrooms had strong evidence of implementation. Second, measurement of both DAP implementation and academic achievement were far from optimum. With regard to measurement of DAP, the Assessment Profile was originally developed for preschool classrooms. How well it applies to elementary grade classrooms is not well understood at present. ADAPT is a newly

developed instrument that is still being field tested, and consequently, its properties are not yet known. The use of standardized achievement tests as the sole measure of academic achievement is also a limitation. The inclusion of alternative assessment measures might have provided a fuller picture of student performance.

DAP and Classroom Behavior

There was some evidence, although not strong and consistent, for a positive association between DAP and student classroom behavior (i.e., strong social skills, fewer problem behaviors). Furthermore, Demonstration group teachers tended to rate the classroom behavior of their students more positively than did Comparison group teachers. This difference between groups was, at best, only partially due to the somewhat higher DAP implementation found in Demonstration classrooms. It is not clear what other factors may explain this difference. Some teachers have suggested that DAP training may have helped them to view children's behavior in a more developmentally appropriate manner, and therefore, in some instances, more positively than they would have viewed it previously. We plan to further explore the reasons for the difference by group in teachers' ratings of children's classroom behavior.

Finally, Hmong children's classroom behavior was rated more highly (stronger social skills, fewer problem behaviors) than that of other children by teachers. This difference does not appear to be linked with DAP implementation. It occurred in both the Demonstration and Comparison groups, and has been consistent across time and cohorts.

Table 1
Developmentally Appropriate Practices
by Treatment Condition

Assessment Profile Scale[a]		Cohort I		Cohort II	
		Demonstration	Comparison	Demonstration	Comparison
Learning Environment	Mean	41.6	35.1 ***	38.8	35.3 ***
	(SD)	(2.3)	(1.3)	(3.0)	(1.7)
Scheduling	Mean	39.9	37.4 ***	41.2	38.0 ***
	(SD)	(1.6)	(2.0)	(2.2)	(3.2)
Curriculum	Mean	45.9	43.2 ***	43.1	39.8 ***
	(SD)	(1.8)	(1.8)	(3.3)	(1.8)
Interacting	Mean	48.7	47.7	48.0	46.1 *
	(SD)	(3.4)	(3.2)	(4.6)	(3.7)
Individualizing	Mean	48.7	47.4 **	47.5	46.5
	(SD)	(1.9)	(1.6)	(3.2)	(2.7)

Note: Study children were assigned Assessment Profile scale scores according to the classrooms they attended. Average scores on each scale were calculated for each child based on the classrooms they had attended from kindergarten through the 1995-96 school year. These average scores are available only for those children who remained in study schools during the entire study period.

[a] Mean = 50, standard deviation = 10.

* $p < .05$
** $p < .01$
*** $p < .001$

Table 2
Regression of Spring 1996 Woodcock-Johnson Test Scores on Baseline Scores and Assessment Profile Scale Scores

	Spring 1996 Woodcock-Johnson Score[a] (Post-test)							
	COHORT I				COHORT II			
	Reading (N=89)		Mathematics (N=89)		Reading (N=123)		Mathematics (N=123)	
Equation	**Beta**	**$\triangle R^2$**	**Beta**	**$\triangle R^2$**	**Beta**	**$\triangle R^2$**	**Beta**	**$\triangle R^2$**
Step 1:		.20***		.19***		.30***		.27***
Respective baseline Woodcock-Johnson score[a]	.45***		.44***		.55***		.52***	
Step 2:		.05		.04		.14***		.13***
Assessment Profile Scale Scores[b]								
Learning Environment	.16		-.03		.06		.03	
Scheduling	-.15		.20		-.16*		-.27***	
Curriculum	-.07		-.06		-.08		.15	
Interacting	-.17		-.05		.36***		.10	
Individualizing	.19		-.10		.15		.12	
Total R^2		.26***		.23**		.44***		.40***

a Woodcock-Johnson scores are reported as W scores which are a special transformation of Rasch ability scores.

b Scale scores are average scores for the classrooms which the child attended since kindergarten.

* $p < .05$
** $p < .01$
*** $p < .001$

Table 3
DAP Implementation and Teachers' Ratings of Children's Social Skills and Problem Behaviors: 1995-96

Children's Social Skills and Problem Behaviors	ADAPT[a] Classroom Summary Scores: No Evidence	Minimal Evidence	Supportive or Strong Evidence[b]	
Social Skills Total Standard Score[c]				
Mean	**104**	**109**	**116**	**
Standard Deviation	17	17	12	
N	142	103	13	
Problem Behaviors Total Standard Score[c]				
Mean	**98**	**95**	**89**	*
Standard Deviation	14	12	8	
N	142	104	13	

a "A Developmentally Appropriate Practice Template," an observation based instrument developed by Margo Gottlieb, 1995).

b This category was composed of two third-grade Demonstration classrooms.

* $p < .05$
** $p < .01$

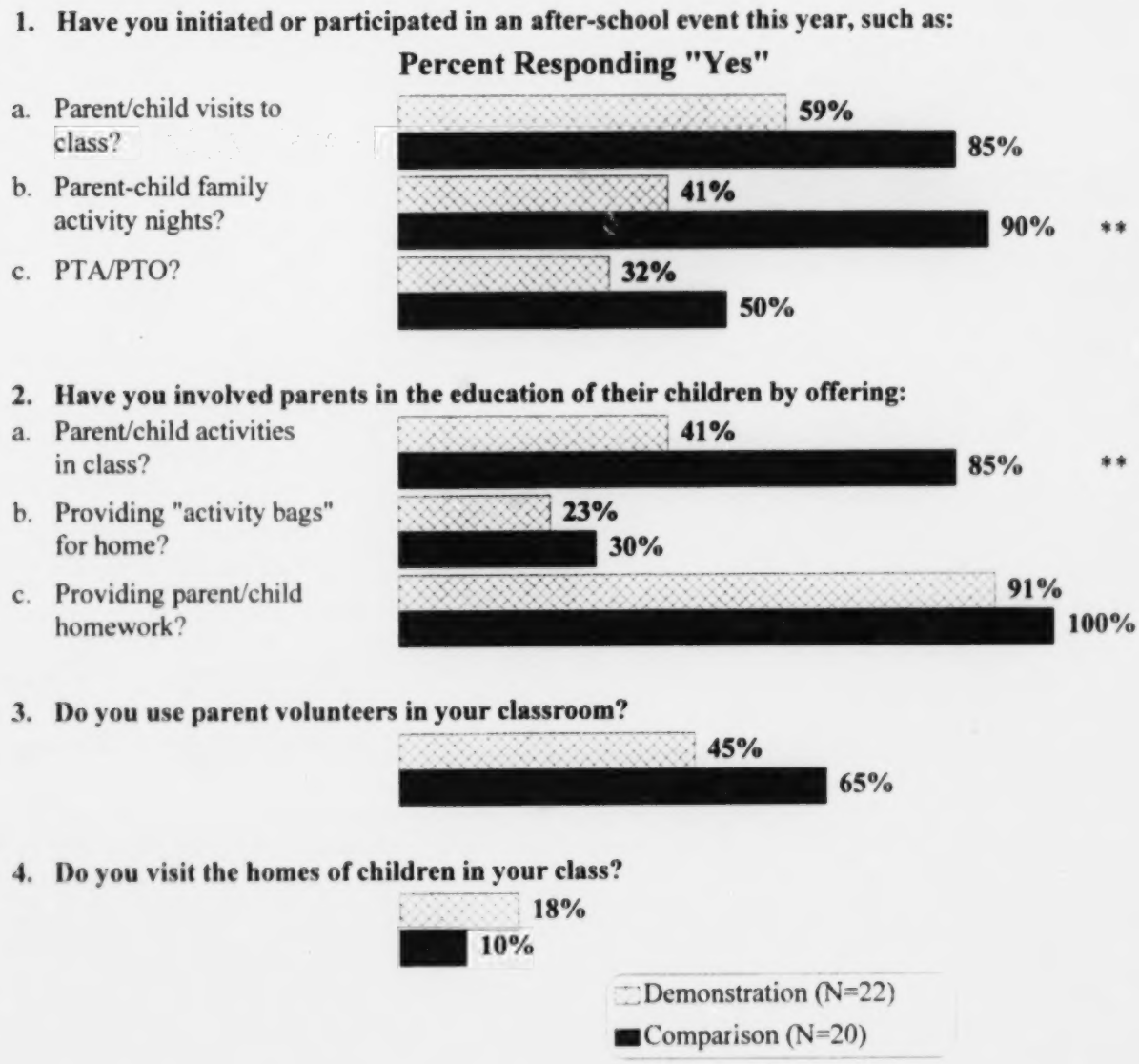
Table 4
Problem Behaviors by Treatment Condition: Spring, 1996

Problem Behaviors Total Standard Score[a]	Treatment Condition[b] Demonstration	Comparison	
Cohort I			
Mean	**95**	**97**	
(SD)	(12)	(13)	
N	49	47	
Cohort II			
Mean	**93**	**101**	**
(SD)	(11)	(15)	
N	91	53	

a Mean = 100, standard deviation = 15.

b Includes only children attending a school in their treatment condition cluster in the spring of 1996.

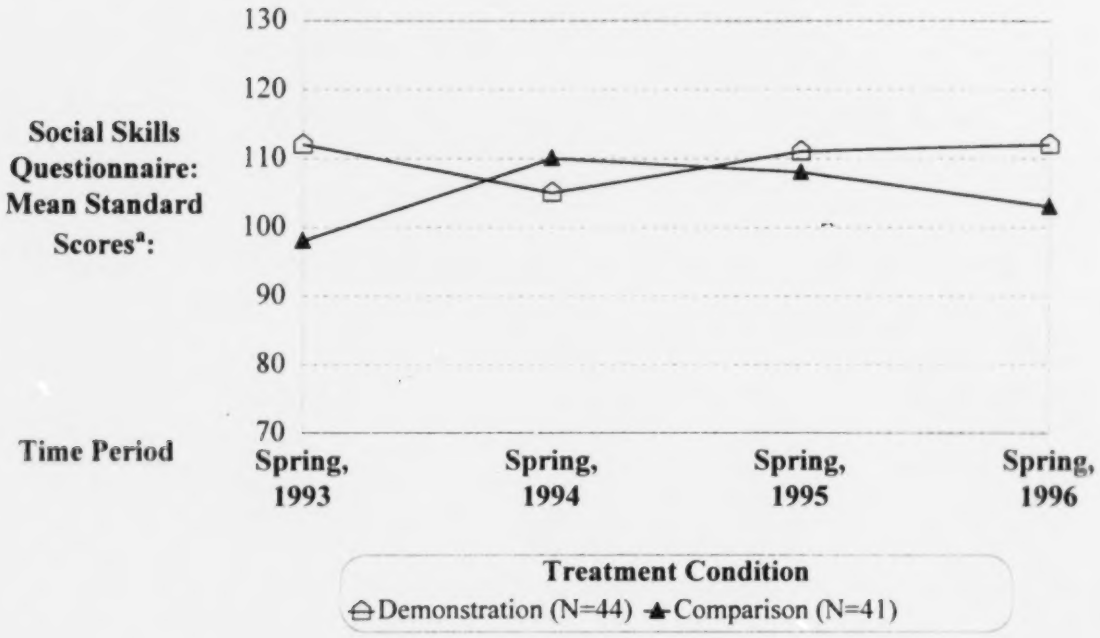
Figure 1
Teachers' Parent Involvement Activities
By Treatment Condition: 1995-96[a]



a Items in this figure are from an adapted version of the Classroom Activity Scale (J. French and M. Blazina, 1994). Second and third grade teachers from Demonstration and Comparison schools responded to the items in the spring of 1996.

** $p < .01$.

Figure 2
Social Skills by Treatment Condition: Cohort I



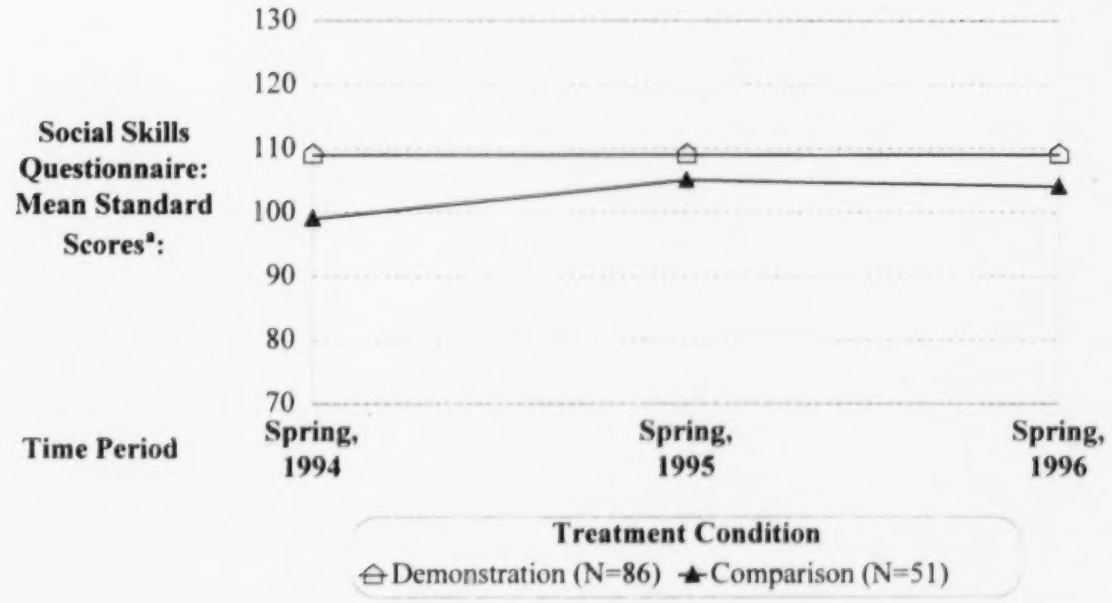
Woodcock-Johnson Broad Reading Scores[a]: Cohort I

Time Period		Demonstration N=44	Comparison N=41
Spring, 1993	Mean (SD)	112 (14)	98 *** (12)
Spring, 1994	Mean (SD)	105 (11)	110 (15)
Spring, 1995	Mean (SD)	111 (15)	108 (19)
Spring, 1996	Mean (SD)	112 (14)	103 *** (16)

a Mean = 100, standard deviation = 15.
b Includes only children attending a school in their treatment condition cluster in the spring of 1996.

* $p < .05$
** $p < .01$
*** $p < .001$

Figure 3
Social Skills by Treatment Condition: Cohort II



Woodcock-Johnson Broad Reading Scores[a]: Cohort II

Time Period		Demonstration N=86	Comparison N=51
Spring, 1994	Mean	109	99 ***
	(SD)	(14)	(18)
Spring, 1995	Mean	109	105
	(SD)	(15)	(16)
Spring, 1996	Mean	109	104
	(SD)	(17)	(18)

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a Mean = 100, standard deviation = 15.
b Includes only children attending a school in their treatment condition cluster in the spring of 1996.

* $p < .05$
** $p < .01$
*** $p < .001$

NOTE

[1] Brief descriptions of each of the five Assessment Profile scales are as follows:

1. Learning environment. Degree to which the classroom: has materials that encourage a variety of learning experiences, is arranged to encourage child independence, and reflects the child as an individual.

2. Scheduling. Degree to which scheduling and planning occur, and the degree to which the written schedule and actual classroom activities reflect variety.

3. Curriculum. Degree to which the teacher fosters multicultural sensitivity and appreciation, alternative teaching techniques are used to facilitate learning, children are encouraged to be active in guiding their own learning, and the curriculum is individualized.

4. Interacting. The degree to which the teacher initiates positive interactions with children, is responsive to children, and positively manages children's behavior; and the degree to which children seem happy and involved in activities.

5. Individualizing. The degree to which child assessment occurs systematically and is used for planning individualized experiences, and the degree to which the teacher has a system for identifying and making provisions in the classroom for children with special needs.

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